During the construction of Laguna Dam, the Reclamation Service began work on the remainder of the proposed YIP features. A small irrigation infrastructure was already in place when the Reclamation Service arrived in the Yuma area, constructed predominantly by small, private irrigation companies that were cultivating small parcels of land. Some of the irrigation features constructed by these companies (most of which were acquired by the Reclamation Service) were used to supply irrigation water while the Yuma Project was under construction. The pumping plant built by the Colorado Valley Pumping and Irrigating Company, for example, was utilized until the completion of a Reclamation-built siphon under the Colorado River. For the most part, however, most of the canals built by the private companies were not used by Reclamation. In at least one case, a private irrigation company, the Irrigation Land and Improvement Company (ILIC), resisted Reclamation offers to purchase their land. Reclamation responded by constructing a canal across the company's property. The ILIC, in turn, responded by taking Reclamation to court, and the case wound up in the Supreme Court. A settlement was eventually reached and Reclamation was able to continue its construction efforts.

When completed, the YIP provided irrigation water to 40 miles of land along the Colorado River, encompassing over 130,000 acres. As originally constructed, the project consisted of one diversion dam, ten primary canals, 218 miles of laterals, one power plant, two pumping plants, and one 930-foot-long siphon (Figure 23) (Pfaff et al. 1992:19). Originally, management of the YIP was divided into three units. Two of these units, the Bard and Reservation Divisions, were located on the California side of the Colorado River. The third, the Yuma Valley Division, was located south and west of the town of Yuma, on the Arizona side of the river. The Yuma Valley Division (generally referred to as the Yuma Valley), is most germane to the current discussion.

Levees

Providing irrigation to agricultural interests in the Yuma Valley served no end if the lands and YIP infrastructure was subjected to the annual, and often severe, flooding that characterized the Colorado River. From the outset, the goal of the YIP was to also provide flood control, of which Laguna Dam was only one part. To this end, a system of levees was constructed downstream of the dam on both sides of the Colorado and Gila Rivers. Although a few levees had been constructed by earlier, private irrigation companies, the Reclamation Service constructed an entirely new system. Construction began in 1905 with 14 miles of levee along the eastern bank of the Colorado River in the Yuma Valley. The Valley Levee, as it came to be called, extended to the Mexican border and was completed by 1911 (Figure 24). Meanwhile, other levees were constructed in other portions of the project. Between 1906 and 1909, levees along both banks of the Gila River were constructed, along with the Reservation Levee between Yuma and Laguna Dam. This latter levee was extended west of Yuma for 3 miles in 1912 (Bischoff et al. 1998:11). The entire levee system was completed by 1919.

Originally, levee embankments varied in height from 4 to 15 feet, extending 3 feet above maximum river level. Initially, levee slopes were protected from river erosion with brush dikes. In some places, steam boats were used to drive spur dikes into the sides of the levees to provide additional protection. The first levees constructed suffered from a number of problems, including the caving of their banks -- caused by the meandering of the river, crevasses in the levees caused by high-water levels in the river, and the undermining of the levees caused by burrowing animals (Reclamation 1912; IBWC 1948). Eventually, rock riprap (large rocks placed on the sides of the levees to give them added erosional resistance) was found to be a superior material for levee construction and the use of brush was discontinued.

Despite the extensive system of levees throughout the Yuma area, floods continued to inundate extensive areas in the early twentieth century. A large flood in 1916, for example, breached the levee and destroyed numerous canals, laterals, and a substantial portion of the railroad embankment. The river fluctuated widely during this flood, extending over 1 mile from its normal flow at Mile Marker 17 in the Yuma Valley (Reclamation 1916). To combat these overflows, a 900-foot-long spur track was constructed along the Yuma Valley Railroad (see below), between Mileposts 17 and 18. The spur track provided a

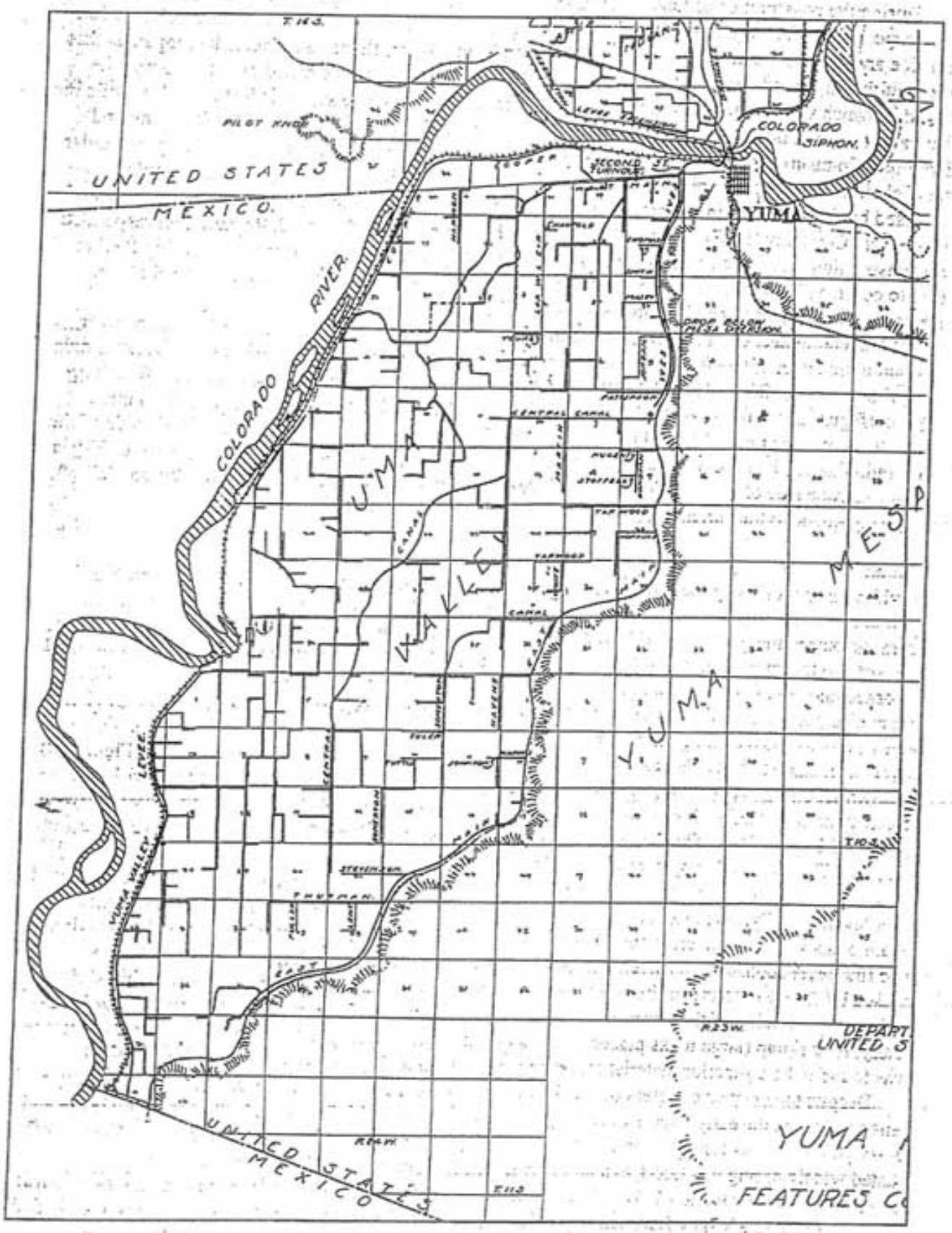

Figure 23. Features of the Yuma Irrigation Project completed in the Yuma Valley as of December 31, 1915.

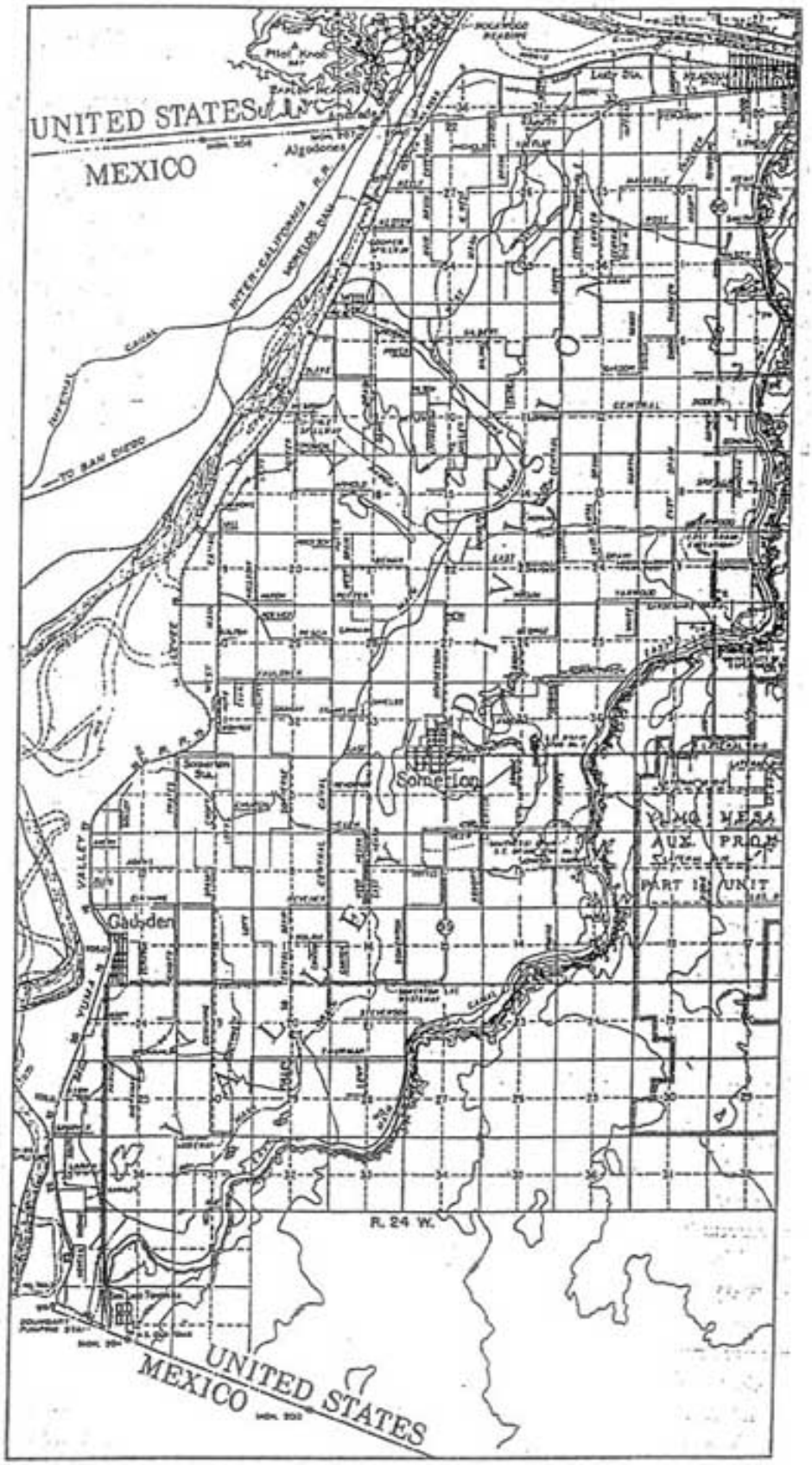

Figure 24. The Yuma Irrigation Project, 1949, showing the Valley Levee, Valley Railroad, and various other irrigation features in the Yuma Valley.

first line of defense against the river and also permitted more work to be conducted on improving the levee in potential breech areas (Reclamation 1922).

A major problem for the YIP throughout the Yuma Valley was seepage. Apparently, water from the Colorado River seeped through the relatively pervious levees and infiltrated the farm lands of the valley. To alleviate this problem, the Reclamation Service constructed a series of drains throughout the valley. The drains captured the water and channeled it south to the border where it was redeposited into the Colorado River. The Main Drain served as the keystone of this drainage project, extending through the middle of the Yuma Valley to the international boundary. Pumps were constructed at key locations to carry the water over the levee and back into the river. The drains solved the seepage problems and greatly contributed to the success of farming in the Yuma Valley (Wells n.d.). During the construction of these drains and pumps an extensive, although temporary, camp was established in Somerton in 1916 (Reclamation 1916). The exact location or duration of the camp is not currently known.

Another problem facing Reclamation Service engineers following the completion of the YIP was the rise of the water table. Because of the large amount of water diverted from the Colorado River into the Yuma Valley, the water table had risen considerably by 1916. The construction of the drain system described above was also designed to help alleviate the problem.

Yuma Valley Railroad

As mentioned above, the original levees constructed to protect the Main Canals in the valley proved to be inadequate. The Reclamation Service had learned that only by using riprap would the levees truly serve as protective features. In order to deliver this material to all portions of the levee, a railroad would be required. Storey (1990:9–10) relates how Reclamation engineer, F. W. Hanna, expressed the need:

> The existence of a railroad on the Reservation levee has made it possible to develop this method of protection, and large quantities of rock have been dropped on the river side of this levee in such a manner that the rock falls into the stream when the cutting bank reaches the levee. Banks that were receding at the rate of several hundred feet per week have been entirely checked by this method, in some cases where the water was 30 feet deep. The Project Engineer states that it is proposed to continue this method of protection as a portion of the Annual Maintenance until the levee is completed. If the levees on the Arizona side of the river are to be protected in this manner it will be necessary to built railroads along them and to haul large quantities of rock for considerable distances.

The Reclamation Service originally hoped to entice the Southern Pacific to build this proposed new line. In the 1910s, the Southern Pacific had constructed its Laguna Branch, which provided transportation for construction activities as well as access to the various levees in the Bard and Reservation units in California. To lure the Southern Pacific, Reclamation claimed that the railroad would "aid materially in the development of Yuma Valley," as well as offer a means by which to transport troops rapidly to the border, should the need arise (Storey 1990:10). The Southern Pacific, however, did not want to construct the line, as the Laguna Branch had proved unprofitable. The Reclamation Service itself began construction on the railroad in 1914. Despite a few labor problems, the line was completed to the international boundary in February 1915 (see Figure 24).

Once completed, the railroad was 23.5 miles long, running from the Reclamation Service's yards adjacent to the Yuma Project Office in Yuma, to the border with Mexico. Nine stations were constructed along the new line: Ludy, Steam, Willets, Spillway, Somerton, Gadsden, Boundary Line, Andrade, and Schlecht. Reclamation constructed a depot at the new town of Gadsden, and section houses at Mileposts 6, 11, 16, and 23. The section houses served the railroad maintenance workers and were modest one and two-room structures. The maintenance workers were responsible for approximately 6 miles of track each, and performed various tasks associated with levee and railroad maintenance, including catching gophers,

removing vegetation, tightening loose bolts, driving spikes, and reporting broken rails (Pfaff et al. 1992:61; Storey 1990:48).

In addition to providing rapid maintenance to levees, Reclamation also used the railroad to entice new settlement. To this end, the railroad began carrying passenger and freight traffic in 1915. Lots were sold in the new town of Gadsden, which was a development of the Arizona-Mexican Land Company. Although the railroad connected with the Southern Pacific in Yuma, however, carrying passenger traffic proved to be unprofitable and was discontinued in 1923. Freight continued to be carried by the railroad, including wood, seed, cotton, lumber, groceries, rock, sand, and winter produce. Once again proving unprofitable, however, freight service was discontinued in 1929. The completion of Boulder and Parker Dams in the late 1930s greatly diminished the need for flood control and bank protection in the Yuma area. As a result, the railroad saw decreased use as a transporter of rock. In 1934, the Southern Pacific Railroad began operating a freight line from Yuma to Somerton Siding. Somerton expanded to include spurs and additional sidings as a result of this new activity. The contract was extended, and as late as 1976, Southern Pacific still carried freight on the Yuma Valley Railroad between Yuma and Somerton (Storey 1990).

By 1950, levee work was carried out via a second berm along the levee upon which maintenance trucks could be driven. In the same year, Reclamation removed the segment of the railroad from Mile post 17.5 to the border with Mexico. The remaining portion of the railroad at that time was, and still is utilized by the Southern Pacific, along with late comers Yuma County Live Steamers Association, and the Yuma Valley Railroad, Inc. (a private company).

Irrigating the Yuma Valley

By 1911, water was being supplied to 285 farmers (with an average holding of 70 acres each) in the Yuma Valley. Reclamation estimates of crop production in the Yuma Valley were approximately $55 per acre, compared to only $35 per acre in the Reservation Division. By this time the most common and profitable crop was alfalfa (Reclamation 1911). By contrast, the two most common crops grown at the outset of the Yuma Project were barley and corn. By 1911, total irrigable land area in the Yuma Valley was estimated at 55,000 acres (Reclamation 1910).

Shortly after the completion of Laguna Dam, construction began on the Yuma Main Canal. Water was drawn from the Laguna Dam reservoir and carried south, along the California side of the river, via the canal. The water was then transported under the Colorado River by the Colorado River Siphon (completed in 1912) and from there was carried via canals to Reclamation Service customers. By the completion of the siphon, the Yuma valley incorporated approximately 55,000 acres, 5,000 of which were not irrigable. To reach the valley, water was carried from the siphon through two primary canals, the East and West Main Canals. The East Main Canal, completed in 1912, extended south from Yuma at Second Street, then traveled along the east side of the Yuma Valley. The West Main Canal bifurcated from the East Main at Second Street, where it traveled west for 2½ miles and then south along the west end of the Yuma Valley to the international border. Construction of the West Main Canal began in 1913 and completed in 1915 (Pfaff et al. 1992:18).

A variety of other water conveyance features were constructed in the years immediately following the completion of the East and West Main Canals and the Colorado River Siphon. These included additional canals, laterals, turnouts, checks, levees, drains, bridges, among others. Taken together, this system of features made large-scale irrigation possible throughout the Yuma Valley. In addition to the completion of new water-conveyance features, the Reclamation Service replaced many of the wood features, those in place before the Reclamation Service began YIP, with concrete ones (Pfaff et al. 1992:66). Although irrigation had been done in the Yuma Valley on a small scale for years, the first gravity-fed

water, made possible by Reclamation's siphon, was delivered to the area in 1912. By 1915, there was a total of 40.3 miles of canals completed throughout the Yuma Valley.

From the beginning of the East Main Canal in Yuma, traveling south, the following named canals were constructed: Header, or Ives ditch; Central Canal; Donovan Canal; Yarwood Canal; Hopkins Canal; Somerton Canal; Havens Canal; Harris Canal; Stevenson Canal; and Thurman Canal [Reclamation 1912:76]. Fewer canals were constructed along the West Main Canal (traveling south from its point of origin): Lawlor Canal and Cooper Canal (Reclamation 1912:77). In addition to the named canals, three concrete bridges, 180 wood bridges, numerous checks, turnouts and road culverts, and 140 farm turnouts and culverts were constructed throughout the Yuma Valley portion of the YIP.

Other Areas Served by the Yuma Project

In addition to the Yuma Valley, other areas were brought under cultivation by the YIP. The Reservation Division was watered by the Reservation Main Canal, which branched off of the Yuma Main Canal at the Indian Heading, northwest of Yuma. Lands within the Gila River Valley, immediately east of Yuma, were also brought under cultivation at this time. These lands were irrigated from the North Gila East Main Canal, also known as the Arizona Main Canal. The North Gila West Main Canal (known as the Levee Canal) also supplied water to the Gila Valley. This area was turned over to the North Gila Valley Irrigation District by the Reclamation Service in 1918, at which time it was no longer considered part of the Yuma Project afterwards (Pfaff et al. 1992:66–67). Irrigation of the Yuma Mesa was envisioned as part of the original Yuma Project. Located within the Valley Division east of Yuma, the mesa included approximately 40,000 acres of potentially irrigable lands. In order to bring this area under cultivation, however, a separate project, known as the Yuma Auxiliary Project (YAP) was initiated, and finally authorized, in 1917. Water was carried to the mesa via the East Main Canal and then the B Lift Pumping Plant at the foot of the mesa east of Somerton. By 1922 the pumping plant was completed and water was supplied to farmers who had purchased lots on the mesa (Pfaff et al. 1992:74–78).

Labor

The YIP was constructed predominantly by Hispanics and Native Americans, with "skilled" positions (carpentry, engineering, pipefitting, etc.) filled almost exclusively by whites (Robertson 1942). Once the majority of YIP features were completed, only a handful of laborers were retained to maintain the system. These employees consisted of gate tenders, zanjeros, pump operators, maintenance foremen, and gopher catchers. Since silt accumulation was a perennial problem, much of the system maintenance crew was utilized to keep the various conveyance features clean. While working on the canal system throughout the Yuma Valley, these laborers generally lived in temporary camps run by the Reclamation Service, managed by a foreman. In addition, numerous corrals were constructed throughout the Yuma Valley to house the large numbers of animals used in construction and maintenance activities (Reclamation 1910).

Local Water Users Associations

As mentioned above, the original intent of the Reclamation Act included repayment to the government for the cost of the irrigation projects. The total cost of the YIP consisted of $2 million for Laguna Dam and approximately $3 million for the power plant, canals, laterals, and siphon. For the Yuma Valley portion of the YIP, the Yuma County Water Users' Association (YCWUA) was established in 1903. The association was a local, private agency that agreed to repay the U.S. government for the cost of the proj-

ect through the sale of irrigated acreage. Settlers in the Yuma Valley area who desired water rights were required to join the YCWUA. The Reclamation Service worked side by side with the YCWUA in the development of the region's agriculture, the two sharing office space at Reclamation headquarters in Yuma (Swanson and Altschul 1991:77).

Additional associations were formed in the project's other divisions. The Bard District and Indian Unit both operated within the Reservation Division. The North Gila Valley Irrigation District was also formed, and eventually became part of the Gila Project. In order to repay the government, the YCWUA was charged $.50 per acre-foot of water beginning in 1913, the same charged to water users in the Gila Valley. Those in the Reservation Division were charged $1.00 per acre foot (Reclamation 1913; YCWUA 1962).

Reclamation retained ownership of the irrigation features constructed, while the local water users associations took over their operation and maintenance. In 1931, the YCWUA took over the task of collecting repayments from individual farmers. During the Great Depression, however, the YCWUA was unable to meet its financial commitments and Reclamation assumed operation of the project. Following World War II, when land and crop values rose again, plans were made for the YCWUA to reassume maintenance and operation of the project, which it did in 1951. By this time, the association consisted o 1,200 members cultivating 51,936 acres (Reclamation 1957). By 1962, the organization had assumed responsibility for not only all the irrigation features within the Yuma Valley, but also the Siphon Drop Power Plant, the Yuma Main Canal, the Colorado River Siphon, the All American Canal, and the California Check and Wasteway (Reclamation 1967a). The YCWUA also made its final payment to Reclamation at this time (YCWUA 1962).

Assessing the Success of the Yuma Irrigation Project

The YIP succeeded in transforming the Yuma area, particularly the Yuma Valley, from arid desert into one of the most productive farming areas in the southwestern United States. Following its completion, irrigation works stretched across the entire valley and countless farms soon sprouted up. The most dominant crops grown in the Yuma Valley through the 1920s consisted of cotton, alfalfa, and vegetables. From a population of only 1,200 people in 1880, the town of Yuma grew to 6,000 in 1912. Yuma became an agricultural center as a result of the project, and remains an important provider of a wide variety of crops today (Swanson and Altschul 1991:77; YCWUA 1962).

Several towns emerged in the Yuma Valley with the completion of the YIP. As has been mentioned, Somerton, with four gins, a bank, and several stores, became a center for cotton farming. The town site of Gadsden was opened in 1915, when the Yuma Valley Railroad reached the area. Apparently, numerous settlers came to the area to buy lots and land.

Prospects looked bright for Yuma following the completion of the YIP, particularly in the Yuma Valley, which was viewed as one of the most productive of the YIP regions. Boosters bragged of Yuma's unlimited farming and ranching potential (MacNichol 1912), enticing settlers with advertisements tha read: "When the Colorado is understood and utilized as successfully as is the greater and better known river of Egypt, it will be recognized as the American Nile, the creator of a new country for the irrigator, and mother of an Occidental Egypt."

The Great Depression

Despite the claims of the boosters, the Yuma area was hard hit during the Great Depression of the 1930s. In actuality, economic conditions had actually begun to deteriorate in the late 1920s, with Reclamation and the U.S. Congress receiving frequent petition for deferments on allocated water repayments. During

the 1930s, conditions worsened, and many banks in Yuma failed. Crop prices dropped as the depression worsened and many settlers lost their farms as land was sold at depressed prices. (Yuma Valley farmland values dropped from a high of roughly $400 to $25 per acre.) Nevertheless, land under cultivation continued to expand. By the late 1940s, total acreage under cultivation had reached 58,000, a figure that largely remains the same today (Pfaff et al. 1992:91; YCWUA 1962).

The local water users associations took advantage of funding made available from the various recovery acts under the federal government's New Deal. As early as 1934, the Valley Division acquired workers through the Emergency Relief Administration, who were used to clear brush and weeds from various canals and laterals. The Civilian Conservation Corps (CCC) also had a presence in the Yuma area, forming several camps (including BR-13 and BR-74) (Figure 25). Men from these camps performed a variety of tasks on the various irrigation systems throughout the Yuma area, including general maintenance on canals and ditches, laying riprap, building roads, landscaping, weed and pest eradication, and leveling spoil banks. In addition, the CCC performed the very necessary task of upgrading many of the irrigations system's components. Because the vast majority of the turnouts, checks, and culverts had originally been constructed with wood, many of these features had to be replaced in the 1930s. At this time, these features were replaced with concrete, which contributed greatly to their longevity (Pfaff et al. 1992; Reclamation 1940).

During the 1930s, the YIP witnessed substantial change. By the late 1930s, it became apparent that water diverted from Laguna Dam was insufficient to supply the needs of both the Yuma (Arizona) and Imperial (California)Valleys. As a result, Imperial Dam was completed in 1938. Imperial Dam largely replaced Laguna Dam as the primary water catchment feature for the YIP. The All American Canal (completed in 1940) was constructed to bring water from the new dam to the Imperial Valley. The construction of the canal also brought a measure of economic activity back to Yuma during the Depression. The canal was soon thereafter utilized to provide water to lands within the Yuma Project also, replacing several sections of the project's original canals. Water was diverted from the All American Canal to the Valley Division at a turnout for the Siphon Drop Power plant, which had been constructed in 1926. The East and West Main Canals, however, continued to carry the water to the Yuma Valley (see Figure 24) (Pfaff et al. 1992:104–105).

The New Deal Years

By 1940, 41 percent of farm owners in the Valley Division did not live on their land, but leased it to others. The economic emphasis of farming had changed as well, with a dramatic shift in crop choice among farmers. Cotton had declined as the preeminent cash crop in the area and was replaced by a variety of winter vegetables (Reclamation 1940:66). By 1945, no cotton was grown in the project area, and dominant crops consisted of flax, alfalfa, barley, lettuce, cantaloupes, carrots, and grapefruits (Reclamation 1945:41).

Other public works programs helped the region regain its economic strength. One of these was the Bracero program that was initiated in the early 1940s as young American men went off to war. The program basically consisted of bringing Mexicans into the United States, under a temporary permit, in order to pick crops. During the war, many small towns that had experienced decline during the Great Depression sprang back to life as a result of the Bracero program. The program also changed the ethnic makeup of many of the towns, as more Hispanics arrived in the area.

Throughout the existence of the Yuma Project, each of its various components and subcomponents had to be maintained and rehabilitated. This work continues today. In 1940, a major earthquake hit the Yuma area, destroying countless irrigation features. The reconstruction work replaced the earlier wood features with more permanent concrete structures. During 1945, groups of German prisoners of war were used to assist in clearing canals and laterals of weeds and brush. Another major period of upgrading

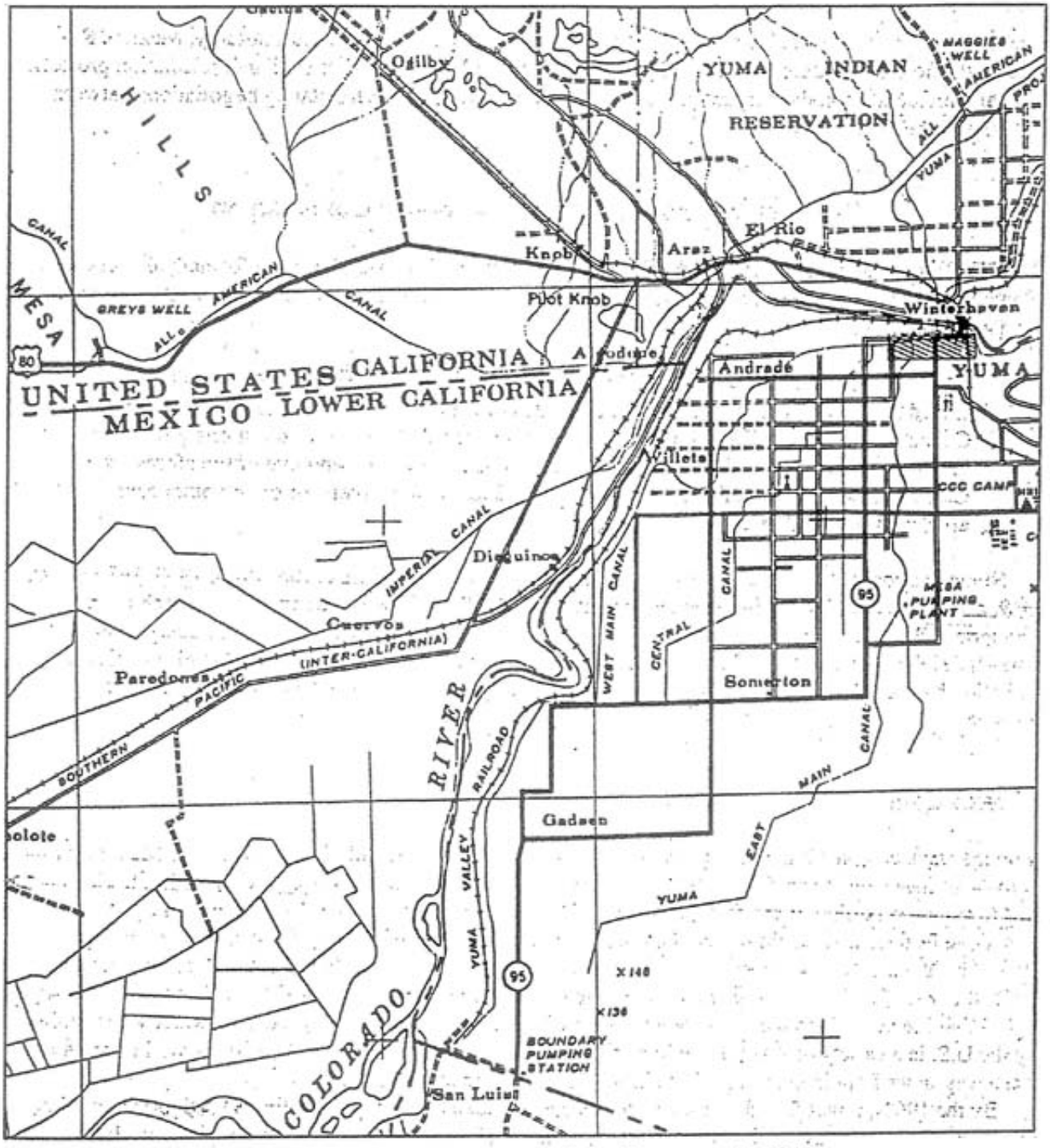

Figure 25. War Department map of the Yuma area in 1941.
Note the location of the CCC camps south of Yuma.

occurred following the passage of the Rehabilitation and Betterment Act of 1949, which allowed for the replacement of many of the original YIP components.

While the YIP figures prominently in the development and history of the lower Colorado River region, especially in the area around Yuma, other water issues have affected and shaped the character of the area. The Reclamation Service's management of the Colorado River had profound implications for

other interested parties who also benefitted from the life force of the river, most notably, Mexico. Restricting the flow of the Colorado to supply the needs of the YIP (and other similar Reclamation projects) had real ramifications on the amount of water that reached Mexico, necessitating negotiations between the two governments.

The International Boundary and Water Commission

The IBWC was established in 1889, when the United States and Mexico began to formally discuss issues emanating from the common use of the Colorado River. The IBWC (1954) was empowered with exclusive jurisdiction over

> all differences or questions that may arise on that portion of the frontier between the United States of America and the United States of Mexico where the Rio Grande and the Colorado Rivers form the boundary line, whether such differences or questions grow out of alterations or changes in the bed of the aforesaid Rio Grande and that of the aforesaid Colorado River, or of works that may be constructed in said rivers, or of any other cause affecting the boundary line.

Numerous conventions and acts were implemented in over the years (1905, 1906, 1933, 1935, 1940, 1949, and 1950), culminating in the Water Treaty of 1944. Basically, the treaty ensured each country a long term and specific program of flood control, equitable distribution of water, water conservation and storage, development of hydroelectric power, stabilization of river boundaries, and the elimination of sanitation hazards. As a part of the 1944 treaty, Mexico agreed to construct a diversion dam at its own expense.

Morelos Dam

Morelos Dam, completed in 1950, allowed for the diversion of Colorado River water into Mexico for the purpose of irrigation. According to terms stipulated in the International Water Treaty of 1944, Mexico was to assume a portion of the costs of construction, operation, and maintenance of levees and other protective features that would protect U.S. lands from floods resulting from the construction of Morelos Dam. The Yuma Levee was reconstructed in 1949 for this reason, in addition to the Reservation Levee in 1951, the cost of which was to be partially borne by Mexico (Reclamation 1954:iii). The treaty also stipulated that Mexico was to receive at least 1,500,000 acre-feet of water per year. This water was supplied by the U.S. in a variety of ways, including release from upstream storage reservoirs, as well as drain and wasteway flows from irrigation projects in the U.S. (Reclamation 1967b).

By the 1960s, it was found that the water reaching Mexico was highly saline. A salinity alleviation program was initiated by Reclamation in 1963, which included the construction of numerous drainage wells and modifications to existing conveyance features. This program was not satisfactory to Mexico, and a subsequent agreement was reached between the two countries in 1965. The agreement stipulated the construction of a bypass channel from the Wellton-Mohawk area to below Morelos Dam. The bypass channel became a part of the Main Outlet Drain Extension (MODE), completed in November 1965, and referred to thereafter as the Bypass Drain. The MODE extended the Main Outlet Drain (MOD) which drained the Gila Project area. All together, the MOD, MODE, and Bypass Drain drained the area between the south Gila Valley and the western Yuma Valley. The drain system also provided water to Mexico, terminating in the Gulf of California (Reclamation 1967b).

Military Presence in the Lower Colorado River Valley

While water and water issues played a paramount role in the development of the lower Colorado region in the twentieth century, we would be remiss to not mention another major developmental factor in the history of the region, namely, the military. We have discussed the importance of the military presence in the region beginning with the Spanish *entrada* in the sixteenth century, but the twentieth century saw the establishment of several important training areas and military installations that played and continue to play an important role in the development of the region.

World War I

A variety of military units were stationed at Yuma throughout the early twentieth century, both regular Army as well as state militia. During the unrest related to Pancho Villa in 1916, detachments from the Arizona National Guard reportedly patrolled the international border, although little is known regarding where these units were based. Elements of the Arizona National Guard that were utilized in the Spanish American War, World War I, and World War II were stationed in Yuma at various periods in the early twentieth century. At the outbreak of World War I, detachments from both the 14th and 35th U.S. Infantry were stationed in Yuma. For the most part, the units were located in town, often performing guard duty on the bridge across the Colorado River. There is no evidence to indicate that these units operated in the largely agricultural Yuma Valley.

Beginning in 1928, Yuma became an increasingly important site for aviation. In that year, Colonel Benjamin Fly persuaded the federal government to establish an airfield outside of the small town of Yuma. The government leased 640 acres of land and the facility became known as Fly Field. The field was utilized over the next decade, but remained a small facility until World War II.

World War II

During World War II, Yuma's population increased from 5,000 people (prior to the war) to over 50,000 in 1942. Two reasons for the increase was the presence of the Desert Training Center, with camps and facilities to the east and west of Yuma, and the establishment of the Marine Air Corps Station, Yuma. A prisoner of war camp was also established near the town of Somerton, housing both Italian and German prisoners of war. But this frenzy of military activity lasted only minimally beyond the end of the war and the population of Yuma shrunk back to approximately 8,000 people by 1950 (*Yuma Daily Sun*, 13 August 1995)

Desert Training Center

During the opening days of World War II, the German Army's Afrika Korps was driving across North Africa with impunity. The Headquarters, Army Ground Forces, sought a location at which to train American soldiers for desert combat and in early 1942, Gen. George S. Patton was ordered to find a suitable location. The deserts of Arizona and California were selected and eventually converted into an 18,000-square-mile training facility called the Desert Training Center (DTC). Following the defeat of the German units in North Africa in 1943, the DTC was maintained, although changed in name to the California-Arizona Maneuver Area (C-AMA). At its height, the DTC/C-AMA could support 11 division-sized (15,000 troops) camps, along with numerous support facilities such as airfields, temporary campsites, railroad sidings, depots, training areas, ranges, hospitals, and maneuver areas. All manner of units were trained including armor, infantry, air. artillery, ordnance, supply, medical, among others (Bischoff 1999).

Two divisional camps existed in close proximity to Yuma. Camp Laguna was located 25 miles upstream of Yuma, on the Arizona side of the river, and Camp Pilot Knob was located a few miles west of town, north of Pilot Knob. Large-scale maneuvers were an integral part of this training, often covering an incredible expanse of territory. In addition, small unit training was undertaken close to the camps and included infiltration courses, rifle ranges, tank exercises, and bivouacking. The construction of pontoon bridges was also practiced on the Colorado River near Pilot Knob (Bischoff 1999).

The troops training in the nearby desert descended upon Yuma, often taxing the small town's resources. All of this activity created a dramatic increase in both vehicular and railroad traffic through the city, often congesting the minimally developed infrastructure of the small town.

Marine Corps Air Station Yuma

In 1941, the federal government began constructing more permanent facilities at Fly Field, and by 1943, it became Yuma Army Air Base. The base was used primarily as a training school for pilots in AT-6s, T-17s, and B-17s. Following the end of the war, the facility was used by a variety of agencies including Reclamation. By 1951, however, the facility was reactivated by the Air Force and was named Yuma Air Base, then Vincent Air Force Base in 1956. In 1959 the facility was turned over to the Navy when it became a Marine Corps Auxiliary Air Station, and finally, Marine Corps Air Station. The base's main mission remained training, which continues today (*Yuma Daily Sun*, 14 April 1994).

Research Themes for Historical-Period Resources within the Lower Colorado River Region

As mentioned above, one of the primary goals of a Class I cultural-resources inventory is to identify known cultural resources within the APE. The following discussion of the historical-period contexts for research in the project area focuses on broad cultural and chronological trends. Combining the information gathered from an understanding of the cultural history and previous archaeological research, we can begin to establish patterns of historical-period land use and cultural trends. It is from these patterns of activity and use that we can begin to formulate research questions relevant to the known and potential cultural resources in the region.

For resources associated with the historic period, a very different set of research domains structures our orientation from those associated with prehistoric or ethnohistoric resources. Research themes important to the study of the lower Colorado River valley reflect important topics that occurred and developed in the Yuma area during the past 450 years. We have defined four historical-period research themes that are of particular significance for Yuma and the lower Colorado River valley: transportation, historical-period land use, military use of the area, and the Yuma Irrigation Project. These research issues are basic to an understanding of the use of the region during the historical period.

Transportation

The movement of Europeans and Euroamericans through the lower Colorado River valley, particularly the area around the Yuma Crossing, is clearly an issue of historical significance. Modes of transportation, patterns of resource procurement and transportation, the availability of transportation routes, and changes in transportation routes through time are all integral themes within this historical context.

A number of historical-period transportation routes have previously been identified within the current project area. Most notably, the location of the Yuma Crossing has defined the character of the area

from the ethnohistoric period onward (Stone 1983, 1988; Swanson and Altschul 1991). Subsequent use of the Yuma Crossing by explorers, frontier settlers, gold miners, the railroad, and the military have substantively defined and affected the development of the region (Stone 1983, 1988; Swanson and Altschul 1991).

In addition to land-use patterns defined by the transportation theme, water-use patterns must not be overlooked. The formative nature of the Colorado River—in the development of transportation, resource procurement, and resource distribution patterns—that shaped the American Southwest during the historical period must be taken into account when discussing the importance of the lower Colorado River valley (Swanson and Altschul 1991).

Research Questions

1. How did transportation patterns differ between Native American and European-Euroamerican groups in the area? Are these patterns linked solely to technological advance, or can basic similarities between the two systems be drawn?
2. Did technological advances in transportation affect the region to differing degrees? How did the development of steamship transportation affect overland transportation? Subsequently, how did the development of rail transportation affect both steamship and overland transportation routes? Although a decidedly remote possibility, could cultural resources associated with steamship transportation remain submerged in the Colorado River or buried under silt along its abandoned channels? Could there be remaining traces of the woodyards or landings that served to supply the steamships and facilitate travel upriver?
3. How did the developing transportation infrastructure affect the local and regional economies? Did the influx of railroad workers significantly affect the development of Yuma and the lower Colorado River valley region?
4. How did technological advances in transportation effect the social, economic, and political character of the Yuma community? In what ways did these technological advances contribute to changes in the land use patterns in the area?
5. What effect did the advances in railroad transportation have on the natural resources in the Yuma Crossing area? How did demands and consumptive patterns change as a result?

Data Requirements

Data required to answer these questions can best be obtained through the identification of transportation-related archaeological sites and the performance of archival research. With the identification of historical-period resources related to transportation (Stone 1988), the identification of additional sites (both terrestrial and underwater) will continue to provide valuable information on the importance of the Yuma Crossing in the development of local, regional, national, and international transportation systems. A review of contemporary accounts of the steamboat industry, including information about operations, routes, accidents, and business records, may reveal information about possible cultural resources associated with steamboat transportation that remain in the vicinity of the Colorado River.

Historical-Period Land Use

As discussed above, one of the chief areas of interest is the development and growth of large-scale irrigation technologies, and the affects of irrigation agriculture on local and regional economies. This

encompasses not only the technological feat of controlling the Colorado River and distributing its water to distant places, and the surviving features themselves, but also the activities of the laborers involved in constructing these hydraulic features.

Research Questions

1. Are remains of workers' encampments associated with construction of the All American Canal, the Gila Main Gravity Canal, and all of the other features associated with the historic Yuma Irrigation Project (YIP) extant? If so, what can they reveal about the working and living conditions under which the construction was performed?
2. What economic and social impacts were engendered by the construction of these irrigation systems at the local, regional, and national levels?
3. How did the construction of irrigation features effect the growth of communities in the Yuma Valley? Are there remaining cultural resources that contain information about the agricultural boom and community development that took place in this region during the early twentieth century? Are there extant remains of historic encampments associated with workers employed in the agricultural industry that resulted from the construction of irrigation features in the Yuma Valley?

Data Requirements

Although some (Pfaff et al. 1992) have suggested that the archaeological remains of canal workers' encampments have been obliterated, it is unclear whether any still remain features associated with the YIP or later additions, such as the All American and Gila Gravity Main Canals. If extant, they might provide useful data. A survey and compilation of economic and social data from historical-period sources can also provide the data necessary to assess the impact of major irrigation works in the project area.

Military Use of the Area

Military use of the area defined much of the history of the region, from the arrival of the first Spanish explorers. Strategic control of the Yuma Crossing was clearly viewed as a top priority since the first Europeans arrived in the region. With the arrival of the first Euroamericans, and the development of the Quartermaster's Depot at the Yuma Crossing (Swanson and Altschul 1991), the military significance of the region was firmly established. Use of the area west of the Colorado River, around Pilot Knob, during World War II to train American troops and test equipment for combat in North Africa continued the military presence in the region (Ezzo and Altschul 1993).

Research Questions

1. Because the Yuma Quartermaster's Depot served as a distribution center for a string of early Euroamerican forts along the Colorado River, does evidence of activity associated with the Depot extend beyond the confines of the Yuma Crossing area?
2. Is there evidence of World War II military activities in the area surrounding Pilot Knob? Did the activities include the use of land and resources in, or adjacent to, the Colorado River? If so, are any impacts from these activities extant?

Data Requirements

Data required to answer these questions can best be obtained through the identification of military-related archaeological sites and additional archival research. The identification of historical-period resources related to military use of the region (Swanson and Altschul 1991) has shed light on early military use in the area of the Yuma Crossing, but additional military sites dating to the period remain elusive. The identification of additional sites will continue to provide valuable information on the importance of the Quartermaster's Depot to the development of military history in the Southwest. Additionally, the area around Pilot Knob is a known location for military maneuvers during the World War II era, although the identification of specific sites associated with this have not been adequately explored. Emphasis on identifying sites of that era will expand our baseline knowledge regarding military use of the region.

Additionally, military records should be examined to determine whether units conducted operations within the project area. Newspaper articles, oral histories, and manuscript collections, all on file at the Arizona Historical Society, Yuma, should also be consulted for information on military activities in the current project area.

Yuma Irrigation Project

The YIP played such a critical role in the development of the region that it forms one of the central research themes for the area. Not only did the efforts of Reclamation forever change the physical nature of the region, but they deeply affected settlement patterns, acculturation, and technological advances in agriculture and agribusiness.

Research Questions

1. What evidence remains for the pre-Reclamation irrigation efforts? Were all of the improvements superseded by Reclamation construction, or were some incorporated into the new system? Can these features be differentiated from YIP features?
2. How did pre-YIP irrigation efforts differ from attempts in other parts of the country? Comparisons between different attempts at irrigation in the pre-Reclamation era will be illuminating. Did farmers in the Yuma Valley, for example, face unique circumstances than other parts of the country? If so, how did they overcome these circumstances?
3. What kind of construction techniques were used in building the YIP? Were these standard techniques, or were innovative methods used? Being one of the first Reclamation projects, how did the YIP affect construction of subsequent projects? How did these techniques change over time?
4. How did the Yuma Valley Railroad compare to those constructed by other companies such as the Southern Pacific? Did construction techniques differ between the two? Aside from the railroad grade itself, what other resources remain from the railroad? An aspect of the railroad that has been neglected in the past is labor. What was the ethnic makeup of the railroad employees? How did this change after the railroad was completed and the employees were maintenance-related only?

Data Requirements

Surveys of the lower Colorado River area in conjunction with archival research will aid in determining whether pre-YIP resources exist in the project area. Archival research should be undertaken at the Yuma Area Office of the Bureau of Reclamation. Project histories should be reviewed along with maps and

aerial photographs. Once a resource is found to be potentially pre-YIP, these archival resources can be consulted for confirmation.

Reclamation project histories for other regions should be consulted and compared against those for YIP. Often, a great deal of information on early irrigation efforts is included in these official, Reclamation reports. Other secondary sources, such as newspaper articles and files at the Arizona Historical Society, Yuma, can also be reviewed to obtain information on how irrigation efforts differed in the lower Colorado River valley from those in other parts of the country.

More-complete surveys of the Yuma Valley area should be completed to locate railroad-related features and sites. Archival research specific to the Yuma Valley Railroad should also be completed. The vast majority of this information will be housed at YAO. Contracts, construction reports, project histories, and maps, will all be useful sources of information on the railroad. Materials on file at the Arizona Historical Society, Yuma, including newspaper articles and private manuscript collections will also prove useful when tracing the history of the railroad. Oral histories may also prove valuable for further information on the construction and maintenance of the railroad.